

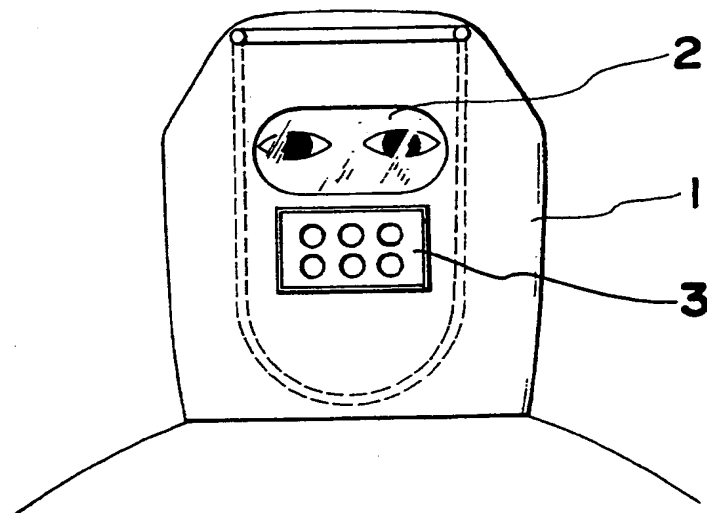
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(54) A head and face protecting hood

(57) A head and face protecting hood comprises a cover (1) having an outer layer which is made of a laminate of non-flammable polyvinyl chloride sheet and non-flammable fibre sheet and an inner layer which is spaced from the outer layer and which is made of a laminate of non-flammable polyvinyl chloride sheet and non-flammable fibre sheet and an inner layer which is spaced from the outer layer and which is made of heat resisting non-woven sheet. The hood also includes an eye screen (2) attached to the cover (1) and made of transparent non-flammable polyvinyl chloride sheet for allowing vision therethrough. The hood also includes a mouth shield (3) attached to the cover (1) below the eye screen (2) and having breath control means provided therein. The breath means has a poison absorbing agent contained therein. The mouth shield (3) includes a mouth piece.

FIG. 1



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FIG. 1

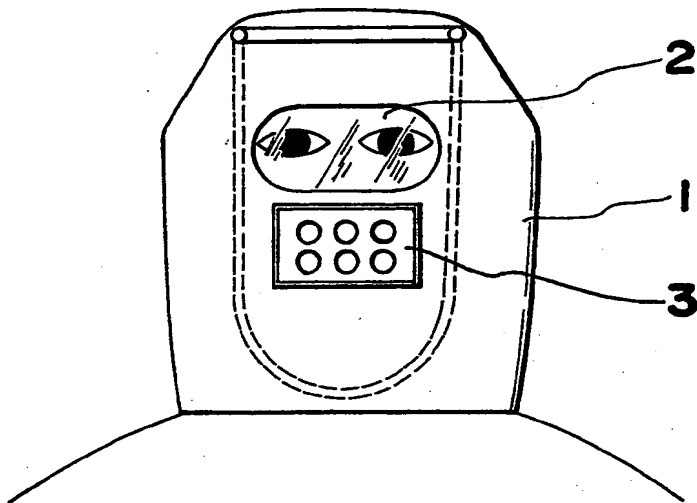


FIG. 2

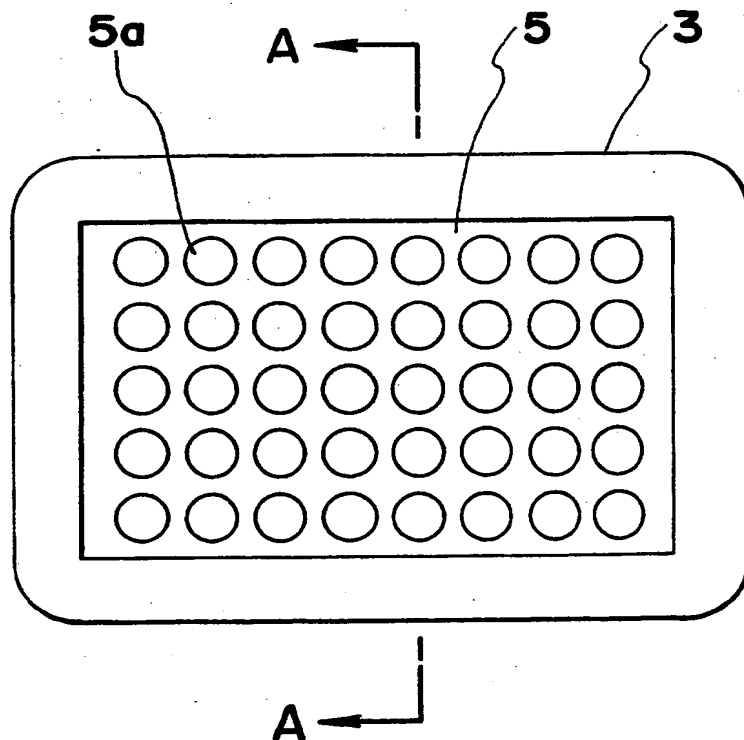


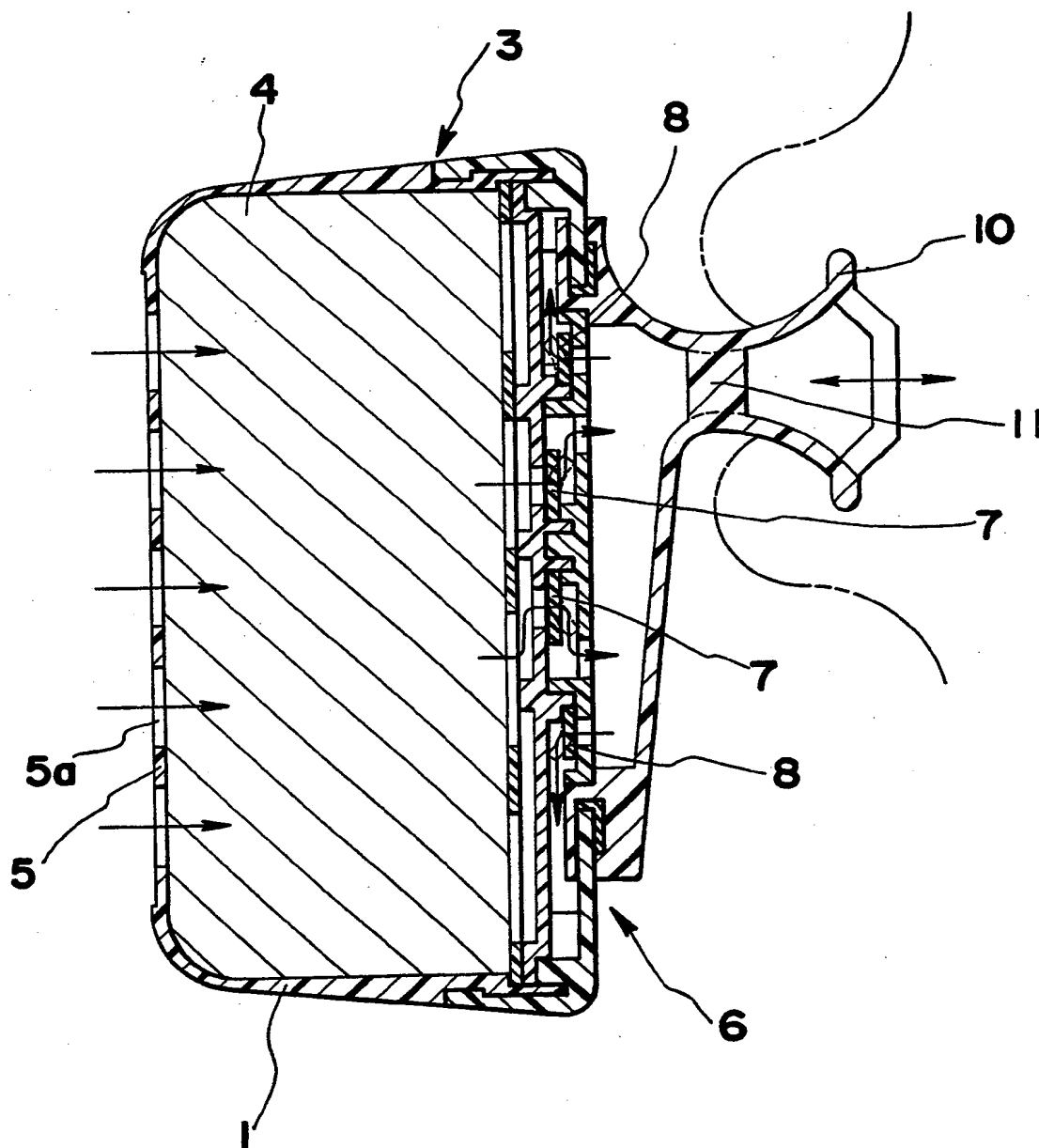
FIG. 3

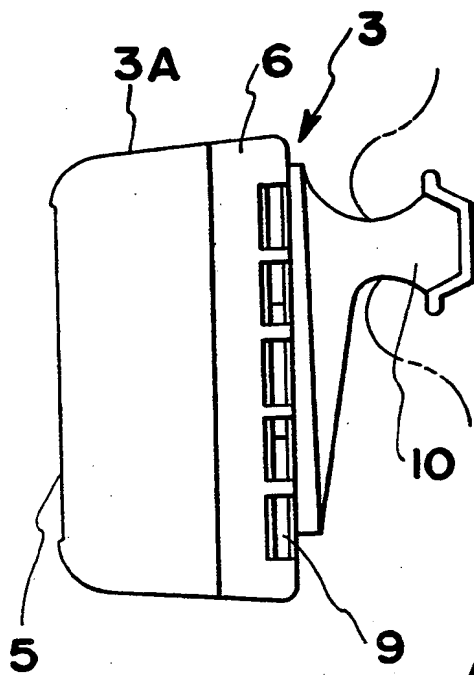
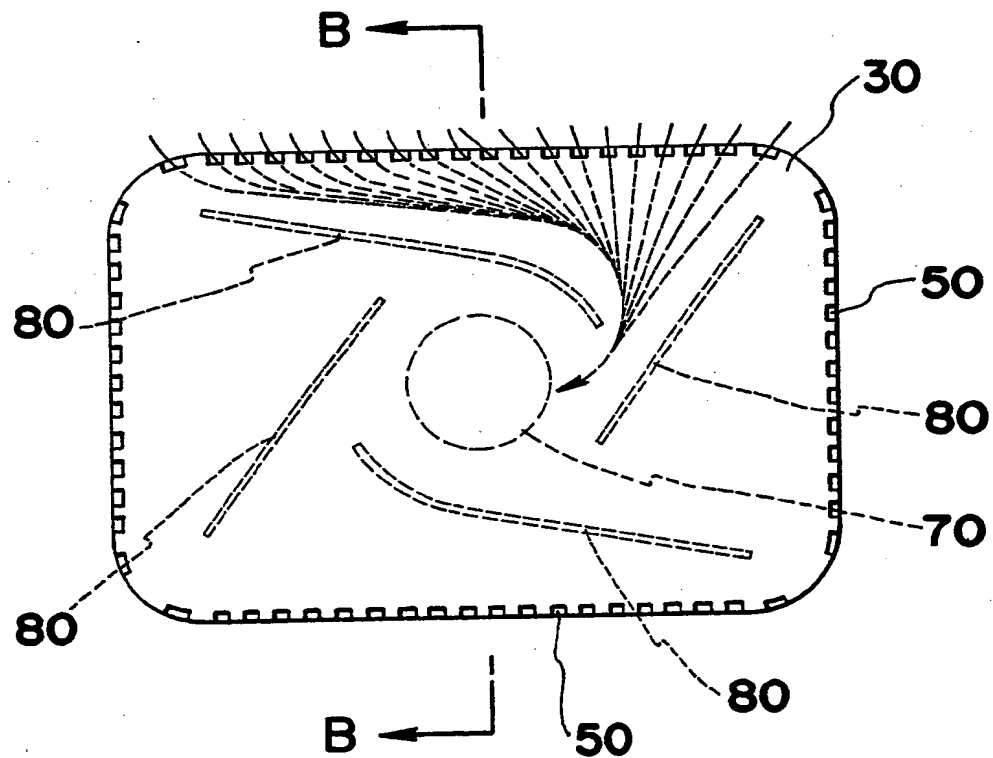
FIG. 4**FIG. 5**

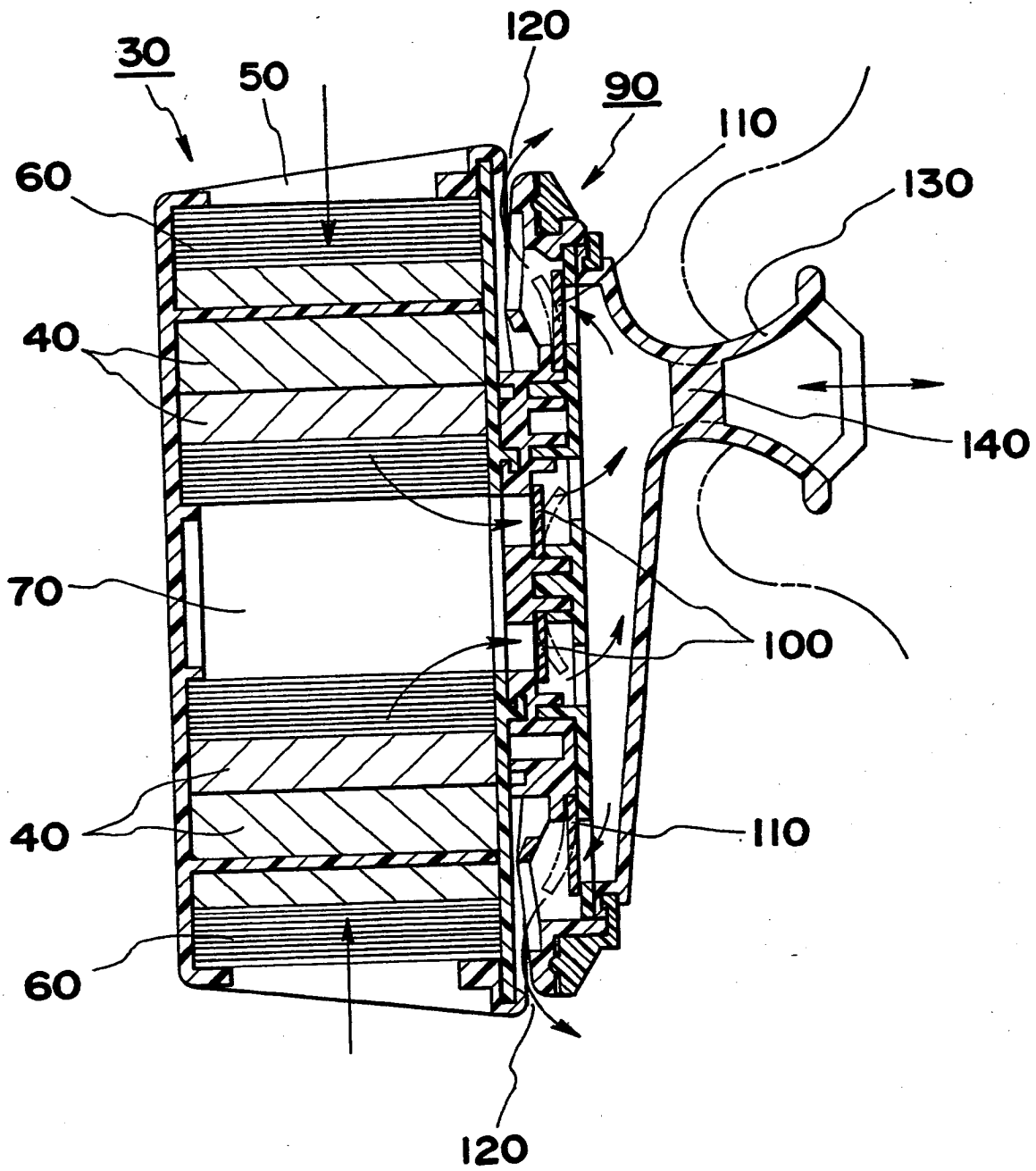
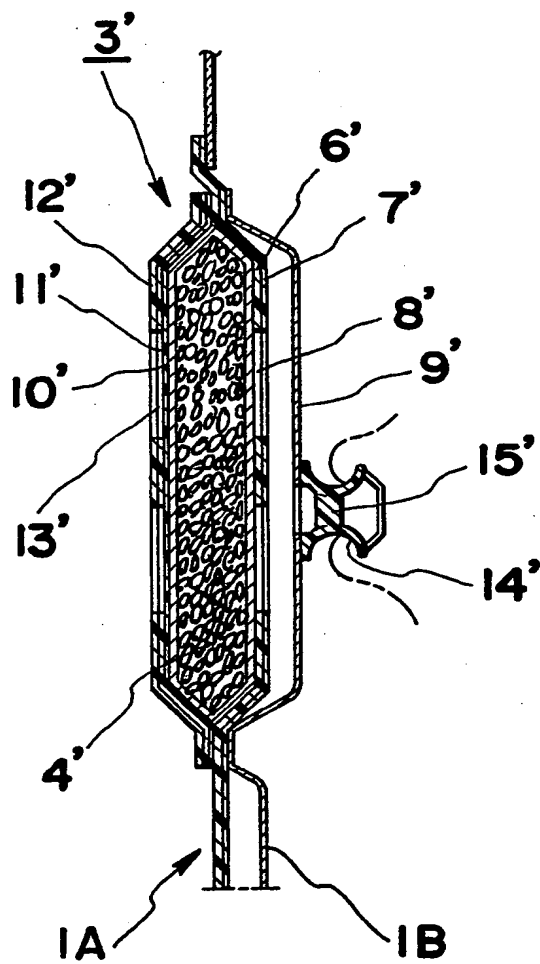
FIG. 6

FIG. 7



SPECIFICATION

A head and face protecting hood

5 Various types of hoods have been used for protecting a person's head and face from fire, smoke and poisonous gases. The hoods of the prior art, however, are constructed in a complicated manner and therefore, in case of emergency and in situations where
10 people do not behave calmly due to terror or fear of the fire, it requires a lot of time to put on such prior art hoods.

Although there have been proposed hoods which can be put on easily, such hoods have generally been
15 made of poor heat resisting material or constructed in a poor heat resisting manner. Thus, such hoods tend to catch fire easily when used in a fire, which results in the head or face of the person using it getting scalded or burned. In the worst cases, the use of such hoods
20 results in the person's death.

Further, since the hoods of the prior art have no means to protect a person from poisonous or noxious gases, there results a difficulty in breathing which causes the person's death or disablement due to gas
25 poisoning.

A preferred head and face protecting hood has been disclosed in United States Patent No. 4,231,118 which was invented by the inventor of the present invention. That hood comprises a cover sheet having
30 an outer layer which is made of a laminate of non-flammable polyvinyl chloride sheet and non-flammable fibre sheet and an inner layer spaced from the outer layer and made of heat resisting non-woven sheet. It also comprises a sheet facing the wearer's
35 eyes and secured to the front wall of the cover sheet and made of non-flammable transparent polyvinyl chloride material for allowing vision through it. It also comprises a mouth facing sheet secured to the front wall of the cover sheet below the eye facing sheet.
40 The mouth facing sheet has front and rear composite layers, each of the composite layers having a first layer portion made of a laminate of perforated non-flammable fibre sheet and a second layer portion made of permeable heat resisting non-woven sheet
45 and adhered to the first layer portion at its edges. A poison absorbing agent such as Zeolite, activated carbon and Dowsonite contained within and covered by a heat resisting fibre layer is disposed between the front and rear composite layers.

50 The hood of this Patent is adapted to allow a wide field of vision, to prevent aspiration of poisonous gases and smokes and to protect the head and face of the person from fire. However, when a person put it on, breathing tends to be disordered due to the strain
55 of the person in cases of emergency. Therefore, although the hood has the effect of absorbing and removing poisonous gases and smokes, breathing will be in an unstable manner because of the requirement for deep breathing due to passing of the
60 air through the multi-layer structure. Thus, it will be noted that the person who puts it on cannot escape in a calm frame of mind in cases of emergency. Further, after breathing in fresh air through the mouth facing sheet, breathing out causes the eye facing sheet to be
65 clouded. Also carbon monoxide gas accumulates

within the hood because the air breathed out is collected without being discharged from the hood.

70 Accordingly, it is the principal aim of the invention to provide a head and face protecting hood which is so constructed that the wearer can breath in and out in a more stable or smoother manner.

It is another aim of the invention to provide a head and face protecting hood which is adapted to discharge from the hood the air which is exhaled so as to
75 prevent an eye screen from being obscured and without accumulating carbon monoxide in the hood.

In accordance with the present invention, there is provided a head and face protecting hood comprising a cover sheet made of non-flammable material, an
80 eye screen secured to the cover sheet and made of transparent non-flammable material, and a mouth-facing sheet secured to the cover sheet below the eye facing sheet, the mouth facing sheet being characterized by including breath control means having a
85 mouth piece.

The nature of the invention should be more clearly understandable by those skilled in the art from the following description of various embodiments which are illustrated in the accompanying drawings in
90 which:

Figure 1 is a front view of a head and face protecting hood constructed in accordance with the invention;

Figure 2 is an enlarged front view of breath control means used in the hood of the invention;

95 *Figure 3* is a sectional view along line A-A of *Figure 2* of the breath control means of *Figure 2*.

Figure 4 is a side elevational view of the breath control means of *Figures 2* and *3*;

100 *Figure 5* is a front view of breath control means constructed in accordance with another embodiment of the invention;

Figure 6 is a sectional view along line B-B of *Figure 5* of the breath control means of *Figure 5*; and

105 *Figure 7* is a sectional view of breath control means constructed in accordance with a further embodiment of the invention.

Referring now to *Figure 1*, there is shown a head and face protecting hood. The hood comprises an overall cover 1 of bag-like shape provided with a lower opening and having an outer layer 1A which is
110 made of a laminate of non-flammable polyvinyl chloride sheet and non-flammable fibre sheet and an inner layer 1B which is spaced from the outer layer 1A and made of heat resisting non-woven sheet. As noted from *Figure 1*, the cover 1 is of sufficient size to cover the head, face and neck of a wearer.

115 An eye screen 2 is secured to a front wall of the cover 1 and is made of transparent non-flammable material sheet such as non-flammable polyvinyl chloride sheet.

A mouth shield 3 is secured to the front wall of the cover body 1 below the eye screen 2 and comprises breath control means 6. *Figures 2, 3* and *4* show an embodiment of the breath control means 6. The
120 breath control means 6 comprises a case 3A which contains a poison absorbing agent 4. An air inlet 5 is provided on a front wall of the case 3A and may be formed of a plurality of holes 5a. A breathing device is provided in the back face of case 3A. As shown in
125 *Figure 3*, the breathing device includes breath intake
130

valves 7 which open when the wearer breathes in, but close when the wearer breathes out and breath outlet valves 8 which close when the wearer breathes in, but open when the wearer breathes out. The breath inlet valves 7 at the upstream side communicate with the air inlet 5 through the poison absorbing agent 4 while the breath outlet valves 8 at the downstream side communicate with an air outlet 9 which may be formed of a plurality of holes on the periphery of the case 3A.

A mouth shield 3 includes a mouth piece 10 which is so provided on the case 3A that the mouth piece 10 communicates with the breath intake valves 7 at the downstream and the breath outlet valves at the upstream side. A separator 11 may preferably be provided in the mouth piece 10 so as to prevent the air passage from being closed.

With the aforementioned hood in use by a person, the mouth piece 10 is held in the person's mouth so as to allow flow of inhaled and exhaled breath. In this manner, air including poisonous gases or smokes is introduced through the air inlet 5 and cleaned by the poison absorbing agent 4. The cleaned air passes through the breath inlet valves 7 when the wearer inhales. When the wearer exhales the air is discharged through the outlet valves 8 which are now opened while the inlet valves 7 are closed. Thus, it will be noted that breathing can be comfortably accomplished through the inlet and outlet valves 7 and 8 respectively. This allows the wearer to escape or to work in a bad environment for a long time. It should be noted that this prevents the eye screen from being obscured because the air breathed out is discharged.

Figures 5 and 6 illustrate a mouth shield comprising breath control means constructed in accordance with another embodiment of the invention. This breath control means comprises a case 30 containing a poison-absorbing agent 40. There is an air inlet 50 on the periphery of the case 30. A filter 60 may be provided on the surfaces of the poison absorbing agent 40. At the centre of the case 30 is an air collector 70. A plurality of separators 80 may be provided through the poison-absorbing agent 40 between the air inlet 50 and the air collector 70. The air introduced through the air inlet 50 flows through air passages defined by the separators 80. Thus, it will be noted that the air contacts the poison absorbing agent 40 for a longer time so that the poisons and smokes are wholly filtered out of the air. A breathing device 90 is mounted in the back face of the case 30. In the same manner as the breath control means 6, it includes breath inlet valves 100 which are to be opened when the wearer inhales and closed when the wearer exhales, and breath outlet valves 110 which are to be closed when the wearer inhales and opened when the wearer exhales. An air outlet 120 is formed between the case 30 and the breathing device. In the same manner as the mouth shield 3, a mouth piece 130 is provided on the breathing device. A separator 140 may also be provided in the mouth piece 130 so as to prevent the air passage from being closed.

With the mouth shield Figures 5 and 6, while the mouth piece 130 is held in the wearer's mouth so that the wearer can inhale and exhale air including poisonous gases and smokes is introduced through

the air inlet 50 and cleaned by the poison-absorbing agent while it flows between the separators 80 so that the air contacts the poison absorbing agent 40 for a longer time. The cleaned air is collected at the air collector 70 and passes through the breath inlet valves 100 when the wearer breathes in while the exhaled air is discharged through the outlet valves 110 which are now opened. At that time, the breath inlet valves 100 are closed. It will be noted that the mouth shield of Figures 5 and 6 allow the wearer to escape or work for a longer time in bad environments.

Figure 7 illustrates a mouth shield constructed in accordance with a further embodiment of the invention. This mouth shield comprises breath control means 3' having a bag-like member containing a poison absorbing agent 4' such as Zeolite, Dowsonite, activated carbon or the like therein. The poison absorbing agent 4' is preferably covered by a heat resisting non-woven sheet 5'. Activated carbon, Zeolite and Dowsonite may be covered by the heat resisting non-woven sheets, respectively; Zeolite and Dowsonite may be combined and covered by the heat resisting non-woven sheet, or all of the three agents are mixed and covered by the adiabatic non-woven sheet. A laminate of a non-flammable polyvinyl chloride sheet 6' and a non-flammable fibre sheet 7' having a plurality of ventilating holes 8' may be provided inside the poison absorbing agent 4' so that it is spaced from the heat resisting non-woven sheet 5' and a non-woven fibre layer 9' such as air-draught spun lace may be provided so that it is spaced from the laminate. Outside the poison-absorbing agent 4' there is provided a non-flammable fibre layer 10' such as an air-permeable substance known under the trade name polychal, which is composed of a polymer of polyvinyl alcohol and polyvinyl chloride. Outside the non-flammable fibre layer 10' there is provided a laminate of non-flammable fibre 11' and non-flammable polyvinyl chloride sheet 12' having a plurality of ventilating holes 13'. A mouth piece 14' is provided on the heat resisting non-woven fibre layer 9' with a separator 15' disposed in the mouth piece 14'. In the embodiment of figure 7, breathing in and out is accomplished through the breath control means 3'. Thus, it will be understood that it can be stably done because the mouth piece is held in the wearer's mouth. This allows the wearer to escape in case of emergency while the wearer breathes in fresh air through the mouthpiece 14' without disordering the breathing.

While some embodiments of the invention have been described with reference to the accompanying drawings, it is to be understood that they are by way of example only, and that various changes and modifications may be made within the ambit of the appended claims.

CLAIMS

1. A head and face protecting hood comprising a cover sheet made of non-flammable material, an eye scree secured to said sheet and made of transparent non-flammable material, and a mouth facing sheet secured to said cover sheet below said eye screen, said mouth facing sheet including breath control

means having a mouth piece.

2. A head and face protecting hood as set forth in claim 1 and wherein said breath control means comprises a case containing a poison absorbing agent, an
5 air inlet at the front of said case, breath inlet valve means to be opened when a wearer inhales and closed when the wearer exhales and breath outlet valve means to be closed when the wearer inhales and opened when the wearer exhales, said inlet valve
10 means communicating with said air inlet through said poison absorbing agent while said outlet valve means communicates with an air outlet provided in said case.

3. A head and facing protecting hood as set forth
15 in claim 1 and wherein said breath control means comprises a case containing a poison-absorbing agent and a plurality of separators provided in said case so that air passages are defined by said separators, an air inlet provided on the periphery of
20 said case, inlet valve means to be opened when a wearer inhales and closed when the wearer exhales and breath outlet valve means to be closed when the wearer inhales and opened when the wearer exhales, said inlet valve means communicating with said air
25 inlet through said air passages while said outlet valve means communicates with an air outlet provided in said case.

4. A head and face protectig hood as set forth in claim 1 wherein said breath control means comprises
30 a bag-like member containing a poison-absorbing agent covered by a heat-resisting non-woven fibre layer having an air-draught, a laminate of non-flammable polyvinyl chloride sheet and non-flammable fibre sheet having a plurality of ventilating
35 holes and a heat-resisting non-woven fibre sheet spaced from said laminate, said laminate and said heat resisting non-woven fibre layer being disposed inside said bag-like member, a non-flammable fibre layer and a laminate of non-flammable polyvinyl
40 chloride sheet and non-flammable fibre sheet having a plurality of ventilating holes.

5. A head and face protecting hood substantially as hereinbefore described with reference to, and as shown in Figures 1 to 4, Figures 5 and 6 or Figure 7 of
45 the accompanying drawings.